

member and by using either or both of a UV irradiation method and a heating method, while the parallelism of the upper surface of the optical member to the image sensing area is maintained.

[0021] In the case of bonding the optical member to each of the semiconductor image sensing elements on the semiconductor wafer, it is also possible to perform an electric test and the like with respect thereto and bond only the semiconductor image sensing elements that have been determined to be acceptable. A test can further be performed after bonding.

[0022] A second method for fabricating a semiconductor image sensing element according to the present invention comprises the steps of: preparing a semiconductor wafer on which semiconductor elements each having an image sensing area, a plurality of electrode portions, and a plurality of micro-lenses provided on the image sensing area are arranged as an array; forming optical members each having a configuration covering at least the image sensing area; forming a transparent bonding member on the image sensing area of each of the individual semiconductor elements on the semiconductor wafer; aligning the optical members with respect to the individual image sensing areas and bonding the optical members to the individual semiconductor elements by using the transparent bonding members; forming a light shielding member on an exposed region of the transparent bonding member over each of the semiconductor elements and on a side surface region of each of the optical members to form openings for exposing the electrode portions; and cutting the semiconductor wafer into the separate individual semiconductor elements.

[0023] The method allows the semiconductor image sensing element having a structure which prevents the incidence of a reflected light beam or a scattered light beam on the image sensing area from the side surface region of the optical member to be fabricated with a high yield and in simple process steps. For the transparent bonding member, a material having either or both of a UV setting property and a thermosetting property can be used by way of example. The transparent bonding member can be formed by a drawing method, a printing method, or the like. The optical member can be bonded by using the transparent bonding member and by using either or both of a UV irradiation method and a heating method, while the parallelism of the upper surface of the optical member to the image sensing area is maintained. The light shielding member can be formed of a paste-like resin material by a drawing method or the like. The light shielding member can also be cured by using either or both of a UV irradiation method and a heating method.

[0024] In the case of bonding the optical member to each of the semiconductor image sensing elements on the semiconductor wafer, it is also possible to perform an electric test and the like with respect thereto and bond only the semiconductor image sensing elements that have been determined to be acceptable. A test can further be performed after bonding.

[0025] A third method for fabricating a semiconductor image sensing element according to the present invention comprises the steps of: preparing a semiconductor wafer on which semiconductor elements each having an image sensing area, a plurality of electrode portions, and a plurality of

micro-lenses provided on the image sensing area are arranged as an array; forming a light shielding film or a light shielding pattern on a side surface of each of optical members having a configuration covering at least the image sensing area; forming a transparent bonding member on the image sensing area of each of the individual semiconductor elements of the semiconductor wafer; aligning the optical members with respect to the individual image sensing areas and bonding the optical members to the individual semiconductor elements by using the transparent bonding members; cutting the semiconductor wafer into the separate individual semiconductor elements; and forming bumps on the electrode portions of each of the semiconductor elements.

[0026] The method allows a face-down-mounted-type semiconductor image sensing element having a structure which prevents the incidence of a reflected light beam or a scattered light beam on the image sensing area from the side surface region of the optical member to be fabricated with a high yield and in simple process steps. For the transparent bonding member, a material having either or both of a UV setting property and a thermosetting property can be used by way of example. The transparent bonding member can be formed by a drawing method, a printing method, or the like. The optical member can be bonded by using the transparent bonding member and by using either or both of a UV irradiation method and a heating method, while the parallelism of the upper surface of the optical member to the image sensing area is maintained.

[0027] In the case of bonding the optical member to each of the semiconductor image sensing elements on the semiconductor wafer, it is also possible to perform an electric test and the like with respect thereto and bond only the semiconductor image sensing elements that have been determined to be acceptable. A test can further be performed after bonding.

[0028] A fourth method for fabricating a semiconductor image sensing element according to the present invention comprises the steps of: preparing a semiconductor wafer on which semiconductor elements each having an image sensing area, a plurality of electrode portions, and a plurality of micro-lenses provided on the image sensing area are arranged as an array; forming optical members each having a configuration covering at least the image sensing area; forming a transparent bonding member on the image sensing area of each of the individual semiconductor elements on the semiconductor wafer; aligning the optical members with respect to the individual image sensing areas and bonding the optical members to the individual semiconductor elements by using the transparent bonding members; forming a light shielding member on a surface of a peripheral circuit region including an exposed region of the transparent bonding member over each of the semiconductor elements and a side surface region of each of the optical members to form openings for exposing the electrode portions; cutting the semiconductor wafer into the separate individual semiconductor elements; and forming bumps on the electrode portions of each of the semiconductor elements.

[0029] The arrangement allows the semiconductor image sensing element having a structure in which the light shielding member is formed on the surface of the peripheral circuit region including the exposed region of the transparent bonding member and the side surface region of the optical